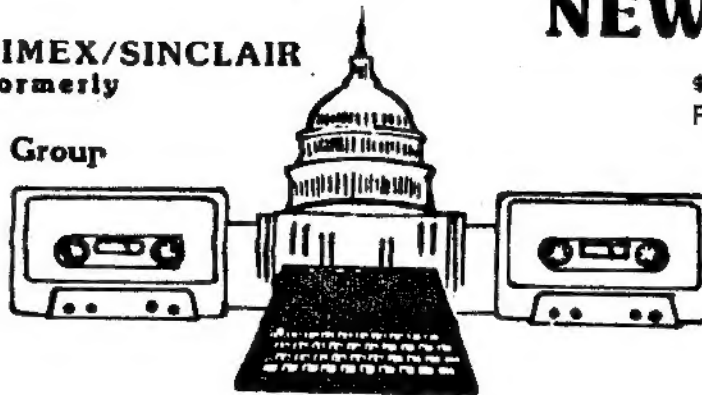


CATS

CAPITOL AREA TIMEX/SINCLAIR
USERS GROUP :Formerly
Prince George's
Timex/Sinclair User's Group

NEWSLETTER

\$1.00 per copy
Please join our club.



SEPTEMBER 1985
Vol 3, No. 6

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YOUR PRESIDENT'S MESSAGE

C. P. Snow was a giant in both the English literary and the scientific worlds. Few men are giants in one field, but in both is extraordinary. He wrote a little book - one among many - called "The Two Cultures". In it he decries the fact that scientists and technologists, who make the world work, don't understand the literary types, the lawyers, journalists and preachers who are our politicians and who rule the country - and that the latter group hasn't the slightest idea what scientists are talking about. Much economic and social damage is done through this lack of communication. Of course, there are some, like Snow, who can bridge the gap, but very few can do this.

In our own little world of computers, we suffer the same lack. The technicians who write the User's Guides and software documentation we read have no idea how the nontechnical user's minds work. Thus much technical writing is undecipherable. Mark Fisher is

a C. P. Snow for our group. I am trying to be another but I am very short on technical skills. I am learning how the computer works by learning machine code. And I am learning machine code by teaching it. I hope with some success. The ten or so of us who have struggled thru to some measure of understanding look forward to using the assembler program to do some simple applications, subroutines and modifications of existing programs like PRO/FILE 2068 in the months after Labor Day.

I hope to learn much more about the technical side of the computer when Tom Bent holds my hand while I make an expansion board for the 2068, to which I want to add more memory and a serial port for a modem. Some day I hope to understand the language Tom speaks after he says: Hi!

Right after Labor Day, I want to add the Applications Group activities we have talked about for some time now. Some members want to go more deeply into investment programs. Some

continued on p.2

CATS Computer Class a Hit With Takoma Park Children

The CATS SWAT team (Special Workers And Teachers) assembled with typical effectiveness the morning of Saturday, August 10 to stage one of its fabled computer literacy classes for a group of attentive 10-to-13-year-old children which had been assembled under the auspices of the Takoma Park Library.

CATS participants began arriving before 9 a.m. at the Takoma Park Municipal Building to set up their Timex/Sinclair gear.

Under the guidance of Mrs. Ellen Robbins, Head Librarian, the Takoma Park Library staff had publicized the class through flyers distributed in the Library as well as through announcements in various city publications. They prepared a leaflet on "User-Friendly Books on Computers for Children". They handled the registration process for the students and obtained the use of the spacious, brightly-lit meeting room in the Municipal Building in which the class was conducted.

The CATS SWAT team provided a broad range of Sinclair circuitry, from a kit-assembled ZX-81 to the latest ROM-switched 2068. Ron Enterline displayed an excellent Commodore color monitor with his 2068, while Evan Evans was thoughtful enough to bring not only his son's T/S 1000 system, but also a backup monitor just in case.

Thanks to the splendid efforts of the CATS members supporting this project (see box), there were eleven working Timex/Sinclair stations available for first-hand computer interaction on the part of the eighteen students.

Hank Dickson opened the session by introducing all the students and CATS participants and by explaining some of the tricks involved in using the special Timex/Sinclair keyboard.

Mark Fisher introduced several of the most commonly used commands associated with the BASIC language and showed how they are used on the Timex/Sinclair.

John Conger talked about binary arithmetic and how a computer adds binary numbers together to get its results.

Hank Dickson illustrated computer logic and flowcharting with the "peanut butter-and-jelly sandwich" exercise, and Mark Fisher finished the presentations by having the students write a simple game program along with him, using BASIC.

Residual time was spent having the CATS members demonstrate their favorite programs to the students.

After a quick bite to eat, the CATS crew packed up their gear and headed to New Carrollton for the general CATS meeting the same afternoon.

All participants agreed that the computer awareness class was an enjoyable and worthwhile undertaking. Many parents asked if they could stay as observers, which they were allowed to do.

"We were particularly glad to be able to reach this fine group of children," remarked Ellen Robbins afterwards. "Hopefully," she added, "we would like to repeat the program in the fall, only this time for adults, many of whom feel left out of new developments such as these."

Should this wish become a reality, the CATS SWAT team would undoubtedly be ready and willing to lend its help and assistance in making the reality as informative and as enjoyable as possible!!

CATS SWAT Team

(Special Workers and Teachers)

August 10, 1985

| | |
|------------------|----------------|
| TOM BENT | Columbia |
| JOHN CONGER | Chevy Chase |
| HANK DICKSON | Lanham |
| RON ENTERLINE | Rockville |
| EVAN EVANS | Seabrook |
| JACK FIELDS | Harford County |
| MARK FISHER | Takoma Park |
| SARAH FISHER | Takoma Park |
| SY FELLERMAN | Kensington |
| LEONARD GODET | Chevy Chase |
| AKIN OLOWOFOYEKU | Hyattsville |

N/L DEADLINE.....MEETING DATE

| | |
|--------------|--------------|
| September 20 | September 14 |
| October 18 | October 12 |
| November 15 | November 9 |
| December 20 | December 14 |

INTERFACE 3

Interface 3 (not made by Sinclair) is one of two hardware solutions currently being offered to the problem of converting tape based software to Spectrum microdrives. With an increasing number of mass storage devices now being offered for the Spectrum and TS2068 many users are now interested in transferring tape based software to such devices.

Us Timex-Sinclair users have to face the fact that there will never be more than a tiny percentage of software on anything other than tape. For Sinclair Microdrive owners Interface 3 seems to offer a complete solution to this problem.

There are software based techniques for transferring software from tape to microdrive, however the ones that are easy to use don't seem to work with recent software and those that do are very difficult to use since they require a lot of user intervention. Interface 3 by contrast is very easy to use and can transfer everything to microdrive. To operate Interface 3 you plug it into the back of Interface 1, then load the tape you wish to transfer to microdrive, then at a break in the program press the red button on the top of the interface. Pressing any key on your Spectrum or TS2068 will then dump the whole computer memory and Z80 registers onto tape in the form of a conversion file. Now you load the conversion software into the computer along with the conversion file. When this has been done a working version of the program may be saved to microdrive.

So far I have only mentioned saving programs to microdrive, however Interface 3 may also be used to make back up copies onto tape. In fact even if you do not have or do not intend to obtain microdrives you may still wish to purchase Interface 3 for making backup tape copies. To do this you will also need a Spectrum adaptor board so your total investment would be about \$90 (about \$55 for Interface 3 and \$35 for the adaptor board). Since there are alternative cheaper methods of making backup tape copies this may not suit many users. However Interface 3 will make backups of any program, something difficult to achieve with recent Spectrum programs.

I discovered that it is also

possible to make working tape copies of microdrive programs with Interface 3. This is not mentioned anywhere in the instructions.

Will interface 3 truly enable you to transfer any program? The answer seems to be yes but I have found one small problem.

When you transfer the final program to tape or microdrive the middle third of the screen is used by the transfer software. This is not a problem on most programs since they can usually be saved on a screen not required when the program is run, such as the loading screens. Most programs have to help pass the time while the program loads from tape. However I have one program (Apocalypse) which uses the map screen it starts with, and while the microdrive version runs it is not much use without the middle third of the map.

One is given the option of not saving the loading screen when using Interface 3 and since part of it is not saved anyway I usually do not save the screen. The advantage of this is that then one can usually get two programs on the 85 to 90K of space on a microdrive cartridge.

There is another hardware device called Mirage Microdriver which does the same job as Interface 3. The Microdriver has its software on Eprom so in principle it is easier to use. However I found Interface 3 easy to use and I think it has one advantage over the Microdriver. Backup copies made using Interface 3 will run on their own without the interface attached but copies made using the Mirage Microdriver will only run with the Microdriver attached.

Interface 3 can be obtained from the English Micro Connection or ordered directly from the manufacturers in Britain. Contact me if you want more details.

TONY BROOKS
972-4541 (eve.)
258-2554 (day)

UNCLASSIFIED

WANTED: FORTH ROM for T/S 1000. Jake Brodsky
726-6335

FOR SALE: ZON-X sound generator for the T/S 1000.
New in box. \$25.00 589-7407

FOR SALE: DIGITAL dual disc drive unit: 2 SSDD TEAC
drives, power supply, and case. New condition,
compatible with AERCO I/F. \$210.00 589-7407

2068 TO SPECTRUM CROSS-REFERENCE

by H. E. Wepler

Ed. note: The following was submitted as an aid to John Conger's machine code class. It is printed here because I feel that it has a more general appeal. Other versions of this list have appeared before: Mike Morris of CATS worked this out, and the LIST group, and Syntax, have both run versions. To my knowledge, this is the first version to be run in one installment. MF

I find it particularly interesting and useful to call the routines stored in the ROM. There is some information on this in the 2068 technical manual, but the most useful source is Logan and O'Hara's book on the Spectrum ROM disassembly.

Of course Logan/O'Hara cannot be used directly, because the memory references only apply to the Spectrum. Consequently, I have prepared the attached "ROM Index." This provides direct reference from most of the routines mentioned in the Technical Manual to the Spectrum routines.

I find the index useful in two ways: First, if I wish to learn more about the contents or use of a routine listed in the Technical Manual, I can look up the corresponding routine in Logan/O'Hara. In many cases the routines are slightly different, because the jumps and calls are to different memory locations. In some cases there are other differences, but in each case the intended use seems to be the same.

Second, if I find a routine in Logan/O'Hara which looks useful, I can usually find it in the 2068 by interpolating in the index. For example, if I wish to use the routine called "GO_TO_2" at 1E73h in Logan/O'Hara, I find in the index "JUMP" and "FIX_U1" which are below and above the desired location. By interpolation I conclude that the routine must be at or near 7933h in the 2068.

While I cannot attend your machine code class, I am attaching the index with the hope that it may be useful to some of those in the class.

ROM INDEX

| 2068 | | | SPECTRUM |
|------|------|--------|----------|
| HEX | DEC | NAME | HEX |
| 0000 | 0 | PLUGIN | 0000 |
| 0010 | 16 | URCH | 0010 |
| 004F | 79 | PHLAF | 004F |
| 0055 | 85 | LE3 | 0055 |
| 0074 | 116 | NEXTCH | 0074 |
| 0077 | 119 | NC_HL | 0077 |
| 0078 | 120 | TC_HL | 0078 |
| 0098 | 152 | TOKENS | 0095 |
| 0227 | 551 | KSCAN | 0205 |
| 0280 | 688 | K_SCAN | 028E |
| 02E1 | 737 | UPD_K | 02BF |
| 035C | 860 | K_BASE | 031E |
| 0371 | 881 | CHCODE | 0333 |
| 03F3 | 1011 | PARP | 0385 |

| | | | |
|------|------|--------|------|
| 1A36 | 1078 | BEEP | 03F8 |
| 0500 | 1280 | SENDTV | 09F4 |
| 053A | 1338 | P_LFT | 0A23 |
| 0554 | 1364 | P_RT | 0A3D |
| 0566 | 1382 | P_NL | 0A4F |
| 0582 | 1458 | SET_AT | 0A9B |
| 05F3 | 1523 | STTVCU | 0ADC |
| 061A | 1562 | LDTVCU | 0B03 |
| 0710 | 1808 | ATTBYT | 0BDB |
| 073F | 1855 | PUTHES | 0C0A |
| 0776 | 1910 | PR_TV2 | 0C3B |
| 0790 | 1936 | TUFL? | 0C55 |
| 07C1 | 1985 | ERR5 | 0C86 |
| 0886 | 2184 | R_ATTS | 0D4D |
| 08A6 | 2214 | K_CLS | 0D6B |
| 08A9 | 2217 | CLLH5 | 0D6E |
| 08EA | 2282 | CLS | 0DAF |
| 0914 | 2324 | SETCUR | 0DD9 |
| 0914 | 2324 | SETTVC | 0DD9 |
| 0939 | 2361 | SCRL | 0DFE |
| 097F | 2431 | CLS_B | 0E44 |
| 0A02 | 2562 | K_DUMP | 0EAC |
| 0A23 | 2595 | DUMPPR | 0ECD |
| 0A35 | 2613 | CLPR | 0EDF |
| 0A4A | 2634 | PRSCAN | 0EF4 |
| 0A82 | 2690 | EDIT_K | 0F2C |
| 0AE7 | 2791 | INSA | 0F81 |
| 0B7E | 2942 | DELSYM | 1016 |
| 0BFD | 3069 | DEL_K | 1097 |
| 0C0E | 3086 | IN_K | 10A8 |
| 0C83 | 3203 | ECHO | 111D |
| 0D00 | 3341 | DESLUG | 11A7 |
| 0D1D | 3357 | K_NEU | 11B7 |
| 0D31 | 3377 | INIT | 11CB |
| 0D82 | 3458 | NEU | 1219 |
| 0E2F | 3631 | LED16 | 12A9 |
| 0E8D | 3725 | LED4 | 1303 |
| 11AA | 4522 | CHINIT | 15AF |
| 11C1 | 4545 | SHINIT | 15C6 |
| 11CF | 4559 | RDCH | 15D4 |
| 11E1 | 4577 | INCH | 15E6 |
| 11EA | 4586 | PUTDIG | 15EF |
| 11ED | 4589 | SENDCH | 15F2 |
| 1230 | 4656 | SELECT | 1601 |
| 123D | 4669 | ERR0 | 160E |
| 1248 | 4680 | SEL_HL | 1615 |
| 12B8 | 4792 | INS1 | 1652 |
| 12B8 | 4795 | INSERT | 1655 |
| 12CA | 4810 | REMSZ | 1664 |
| 1324 | 4900 | GET_LN | 1695 |
| 132D | 4909 | LCU2 | 169E |
| 133F | 4927 | CLEL | 16B0 |
| 134E | 4942 | X_CALC | 16BF |
| 1354 | 4948 | RESET | 16C5 |
| 1363 | 4963 | X_T_HL | 16D4 |
| 1368 | 4971 | SEARCH | 16DC |
| 139F | 5023 | CLOSE | 16E5 |
| 13A8 | 5032 | RSTSTR | 16EE |
| 13BE | 5054 | CLCHAN | 1701 |
| 142A | 5162 | OPEN | 1736 |
| 1465 | 5221 | OPCHAN | 175D |
| 14E1 | 5345 | LIST | 1795 |
| 1541 | 5441 | K_LLST | 17F5 |
| 1545 | 5445 | K_LIST | 17F9 |
| 15A1 | 5537 | PUT_SR | 1855 |
| 15AC | 5548 | LPO | 1860 |
| 15C9 | 5577 | PUT | 187D |
| 160D | 5645 | FLASHA | 18C1 |
| 162D | 5677 | PR_CUR | 18E1 |
| 165B | 5723 | NEXT_L | 190F |
| 1668 | 5736 | DE_HL | 191C |
| 16D6 | 5846 | FIND_L | 196E |
| 16E8 | 5864 | CP_BC | 1980 |
| 16F0 | 5872 | SUBLIN | 1988 |
| 16F3 | 5875 | SUBLN1 | 198B |
| 1720 | 5920 | RECLN | 198B |
| 174D | 5965 | DEL_DE | 19E5 |
| 1750 | 5968 | DELREC | 19E8 |

| | | | | | | | |
|------|-------|--------|------|------|-------|--------|------|
| 1768 | 5992 | LINENO | 19FB | 2EBD | 11965 | LET | 2AFF |
| 1788 | 6024 | PUT_BC | 1A1B | 2FAF | 12207 | POPSTR | 2BF1 |
| 1795 | 6037 | PUT_LN | 1A2B | 2FC0 | 12224 | DIN | 2C02 |
| 1945 | 6469 | SYNTAX | 1A48 | 3046 | 12358 | ALNUM? | 2C88 |
| 19E0 | 6624 | TEMP38 | 1ADF | 3048 | 12363 | ALPHA? | 2C8D |
| 19E1 | 6625 | TEMP39 | 1AE0 | 3059 | 12377 | STKUSN | 2C98 |
| 1A27 | 6695 | SYNTAX | 1B17 | 30D9 | 12505 | DIGIT? | 2D1B |
| 1A44 | 6724 | LS4 | 1B28 | 30E6 | 12518 | STK_A | 2D28 |
| 1AB9 | 6841 | ENDSTT | 1B76 | 30E9 | 12521 | STK_BC | 2D2B |
| 1AD8 | 6872 | EXCUTE | 1B8A | 30F9 | 12537 | ININT | 2D3B |
| 1B44 | 6980 | END? | 1BEE | 3100 | 12557 | KEY | 2D4F |
| 1B4A | 6986 | ENDTEN | 1BF4 | 3130 | 12605 | LDDE | 2D7F |
| 1B82 | 7042 | TEM1 | 1C1F | 314A | 12618 | STDE_U | 2D8C |
| 1B91 | 7057 | ERR2 | 1C2E | 314C | 12620 | STDE_S | 2D8E |
| 1BBC | 7100 | LT22 | 1C59 | 3160 | 12640 | FP2BC | 2DA2 |
| 1BDC | 7132 | DYADIC | 1C79 | 3193 | 12691 | FP2A | 2D05 |
| 1BE5 | 7141 | TEM6 | 1C82 | 31A1 | 12705 | OUTPUT | 2DE3 |
| 1BED | 7149 | SYNERR | 1C8A | 335A | 13146 | SUM5 | 2F9B |
| 1BEF | 7151 | TEM10 | 1C8C | 3379 | 13177 | SUMSLD | 2FBA |
| 1C49 | 7241 | OPTNO | 1CDE | 339C | 13212 | SHIFT | 2FDD |
| 1C51 | 7249 | STK_0 | 1CE6 | 33CE | 13262 | SUB | 300F |
| 1C59 | 7257 | STOP | 1CEE | 33D3 | 13267 | ADD | 3014 |
| 1C78 | 7288 | FOR | 1D03 | 3468 | 13416 | MULT | 30A9 |
| 1D28 | 7464 | SKIP | 1D86 | 3489 | 13449 | TINES | 30CA |
| 1D55 | 7509 | NEXT | 1DAB | 356C | 13676 | ERR6 | 31AD |
| 1D97 | 7575 | READ | 1DED | 356E | 13678 | DIVIDE | 31AF |
| 1E82 | 7810 | DATA | 1E27 | 35D3 | 13779 | TRUNC | 3214 |
| 1ECA | 7882 | RESTBC | 1E45 | 3656 | 13910 | FLOAT | 3297 |
| 1ED4 | 7892 | RAND | 1E4F | 3684 | 13956 | CALC | 3254 |
| 1EE4 | 7908 | CONT | 1E5F | 371A | 14106 | CTRO | 335B |
| 1EF1 | 7921 | JUMP | 1E67 | 3768 | 14184 | ROOM? | 33A9 |
| 1F1E | 7966 | FIX_U1 | 1E94 | 3773 | 14195 | STK_H | 33B4 |
| 1F23 | 7971 | FIX_U | 1E99 | 377F | 14207 | RAND | 33C0 |
| 1F29 | 7977 | ERRB | 1E9F | 37C5 | 14277 | ARRAY | 3406 |
| 1F36 | 7990 | CLEAR | 1EAC | 382D | 14381 | NEGATE | 346E |
| 1F39 | 7993 | CLR_BC | 1EAF | 3904 | 14596 | TESTO | 34E9 |
| 1F99 | 8089 | GO_SUB | 1EED | 3926 | 14630 | STBOOL | 350B |
| 1F8B | 8123 | CHK_SZ | 1F05 | 3ABB | 15035 | INTDIV | 36A0 |
| 1FCF | 8143 | ERR4 | 1F15 | 3ACA | 15050 | INT | 36AF |
| 1FD4 | 8148 | RETURN | 1F23 | 3ADF | 15071 | EXP | 36C4 |
| 1FEB | 8171 | PAUSE | 1F3A | 3B2E | 15150 | LN | 3713 |
| 2009 | 8201 | BREAK? | 1F54 | 3B9E | 15262 | ANGLE | 3783 |
| 201D | 8221 | DEF | 1F60 | 3BC5 | 15301 | COS | 37AA |
| 214F | 8527 | SYNTUO | 1FC3 | 3BD0 | 15312 | SIN | 37B5 |
| 2155 | 8533 | K_LPR | 1FC9 | 3BF5 | 15349 | TAN | 37DA |
| 2159 | 8537 | K_PRIN | 1FCD | 3BFD | 15357 | ATN | 37E2 |
| 217E | 8574 | P_SEQ | 1FDF | 3C4E | 15438 | ASN | 3833 |
| 21E7 | 8679 | TERM? | 2048 | 3C5E | 15454 | ACS | 3843 |
| 220F | 8719 | STRITO | 2070 | 3C65 | 15461 | ROOT | 384A |
| 222B | 8747 | INPUT | 208E | 3C6C | 15468 | TO_THE | 3851 |
| 226B | 8811 | I_SEQ | 20C1 | 3C89 | 15497 | SEPRNT | 09A1 |
| 237E | 9086 | ERRH | 21D4 | 3CA8 | 15528 | LDNES | 09C1 |
| 2380 | 9088 | NOTKB? | 21D6 | | | | |
| 238C | 9100 | GR_COL | 21E2 | | | | |
| 23A6 | 9126 | COLITH | 21FC | | | | |
| 238B | 9147 | TV_COL | 2211 | | | | |
| 23DE | 9182 | COLOUR | 2234 | | | | |
| 241D | 9245 | HIFLSH | 2273 | | | | |
| 243E | 9278 | BORDER | 2294 | | | | |
| 2603 | 9731 | SCRMBL | 22AA | | | | |
| 2624 | 9764 | F_PNT | 22CB | | | | |
| 2635 | 9781 | PLOT | 22DC | | | | |
| 263E | 9790 | PLOTBC | 22E5 | | | | |
| 2660 | 9824 | GET_XY | 2307 | | | | |
| 2679 | 9849 | CIRCLE | 2320 | | | | |
| 26DB | 9947 | DRAW | 2382 | | | | |
| 2810 | 10256 | DRAW_L | 2487 | | | | |
| 2813 | 10259 | DRAWLN | 248A | | | | |
| 2854 | 10324 | EXPRN | 24FB | | | | |
| 2889 | 10377 | INTPT? | 2530 | | | | |
| 288E | 10382 | F_SCRN | 2535 | | | | |
| 28D7 | 10455 | F_ATTR | 2580 | | | | |
| 29B6 | 10678 | RND | 25F8 | | | | |
| 29E5 | 10725 | F_PI | 2627 | | | | |
| 29F2 | 10738 | F_INKY | 2634 | | | | |
| 2C69 | 11369 | NXT_HL | 28AB | | | | |
| 2C70 | 11376 | FIND_N | 28B2 | | | | |
| 2D54 | 11604 | GET_EL | 2996 | | | | |
| 2E10 | 11792 | SLICER | 2A52 | | | | |
| 2E70 | 11888 | PSHSTR | 2AB2 | | | | |
| 2E74 | 11892 | PAEDCB | 2AB6 | | | | |

OF INTEREST BUT NOT LISTED IN
2068 TECH MANUAL:

| | | | |
|------|-------|--------|------|
| 0F65 | 3941 | RPTMSG | 1391 |
| 1EFD | 7933 | GOTO_2 | 1E73 |
| 266D | 9837 | GET_A | 2314 |
| 2F17 | 12055 | L_NUM | 2B59 |

EXROM:

| | | | |
|-------|-------|--------|------|
| 0068x | 104x | U_TAPE | 04C2 |
| 00E5x | 229x | U_BORD | 053F |
| 00FCx | 252x | R_TAPE | 0556 |
| 0189x | 393x | RD_BIT | 05E3 |
| 018Dx | 397x | R_EDGE | 05E7 |
| 01ABx | 427x | SLUH | 0605 |
| 05CCx | 1484x | LOAD | 0808 |
| 06E5x | 1765x | MERGE | 08B6 |
| 0851x | 2129x | SAVE | 0970 |

H.E.UEPPLER

Thanks to Edvard & Tony for using
Bold print on their 2040s!

MF

Simple Interest Computing

Program for the 2068

The following program calculates the interest you will earn if you deposit money in a bank in one of two ways. The first method computes the interest on a fixed amount for an interest rate, compounding interval, and amount invested that you specify. The second computes the interest earned and money available at the end of a term when regular, fixed amount deposits are made.

Ward R. Seguin

5 REM Variables

E- Earnings
I- Investment
INT- Fixed interest rate
CI- Compounding intervals
per year
YR,MO- Investment Period
in years and months
TOT- Total investment and
earnings
DEP- Regular equal deposit
amounts
NO- Number of deposits per
year
TI- Total investment

```
10 PRINT : PRINT : PRINT : PRI
NT
15 PRINT "          MENU"
20 PRINT : PRINT
25 PRINT "1. Interest on fixe
d investment"
30 PRINT
35 PRINT "2. Interest on regu
lar deposits"
40 PRINT : PRINT "3. Exit pro
gram"
41 INPUT A: IF A=2 THEN GO TO
500
42 IF A=3 THEN CLEAR : PRINT A
T 15,1:"STOP PROGRAM, NORMAL EXI
T": STOP
200 REM -Interest on fixed
investment
205 CLEAR
210 PRINT "Enter investment"
220 INPUT I: PRINT I
230 PRINT "Enter interest rate"
235 PRINT " (in percent)"
240 INPUT INT: PRINT INT;: PRIN
T "%
250 PRINT "Enter compounding"
260 PRINT " intervals/year"
270 INPUT CI: PRINT CI
```

```
280 PRINT "Enter investment "
285 PRINT " period"
290 PRINT
295 PRINT " Years "
300 INPUT YR: PRINT YR
310 PRINT " Months "
320 INPUT MO: PRINT MO: PRINT
330 REM -Calculate E
335 LET YRR=(YR*12+MO)/12
336 LET INT=INT/100
340 LET E=I*(((1+INT/CI)^(CI*YR
R))-1)
345 LET E=(INT (E*100))/100
350 LET TOT=I+E
360 PRINT "Interest earned "
PRINT E: PRINT
370 PRINT "Total money "
PRINT TOT
400 GO TO 1
500 REM - Interest on regular d
deposits.
501 CLEAR
510 PRINT "Enter regular
15 PRINT " deposit amounts
520 INPUT DEP: PRINT DEP
530 PRINT "No. of deposits "
540 INPUT NO: PRINT NO
550 PRINT "Investment period
570 PRINT " Years
580 INPUT YR: PRINT YR
590 PRINT " Months
600 INPUT MO: PRINT MO
610 LET YRR=(YR*12+MO)/12
620 PRINT "Enter interest rate
630 INPUT INT: PRINT INT;: PRIN
T "%
635 LET INT=INT/100
640 REM - Calculations
650 LET P=(((1+INT/NO)^(NO*YRR)
)-1)/(INT/NO)
660 LET E=DEP*(P-NO*YRR)
665 PRINT
667 LET E=(INT (E*100))/100
670 PRINT "Earnings
675 PRINT
680 PRINT "Total money
690 LET TOT=E+ DEP*NO*YRR: PRIN
T TOT
695 PRINT " available"
800 GO TO 1
```

Tidbit Time

When Mark Szabo visited us from Cincinnati, he promised CATS a copy of his excellent graphics utility for our club library, as soon as he has finished polishing it up.

In the meantime, he left us with this tidbit:

```
20 SOUND 7,7;8,16;9,16;10,16;
12,200;13,10
30 FOR I=0 TO 31 STEP 2: SOUND
6,I: NEXT I: PRINT AT 0,0;I;" ":
NEXT I: FOR I=37 TO 0 STEP -2:
PRINT AT 0,0;I;" ":SOUND 6,I:
NEXT I: GO TO 30
```

VOICE SYNTHESIZING PART 1

A few years ago voice synthesis was more a dream than reality. Thanks to the current technology two IC's are readily available. They are the Votrax SC-01A and the SPO256-AL2.

All voice synthesizers use phonemes (speech sounds) to generate words. This means that the voice synthesizer sees words as sounds not as letters. Also sounds of letters change depending on their location and grouping with other letters. The word hello appears as HH EH LL AX OW PA3 (PA= PAUSE) to the SPO256 and as H EH1 L L O PA0 to the SC-01A.

The Votrax SC-01A uses 64 phonemes in seven categories—the first six cover voiced, fricatives, and nasal sounds, while the seventh is silence. There are 127 preprogrammed words in the resident ROM and can access EPROMS for user programmed words. By using preprogrammed words one can access a word with a byte instead of 6 bytes as in the case of the word hello. Sound can also be addressed so you can generate words from BASIC programs using POKE. It also has programmable pitch control and inflection control for a more human sounding voice. The Votrax SC-01A is available through Advanced Computer Products, P.O. Box 17329, Irvine, CA. 92713; for \$39.95.

The SPO256 Speech Processor also has seven different sound categories. The resident 16K ROM contains 57 sounds and 5 pauses. The SPO256 can access upto 491K of ROM for word storage. Since there is no words stored in the resident ROM only sounds can be accessed. This means that to generate a word you may have to use upto 20 bytes. The SPO256 is available at any Radio Shack Store for \$12.95.

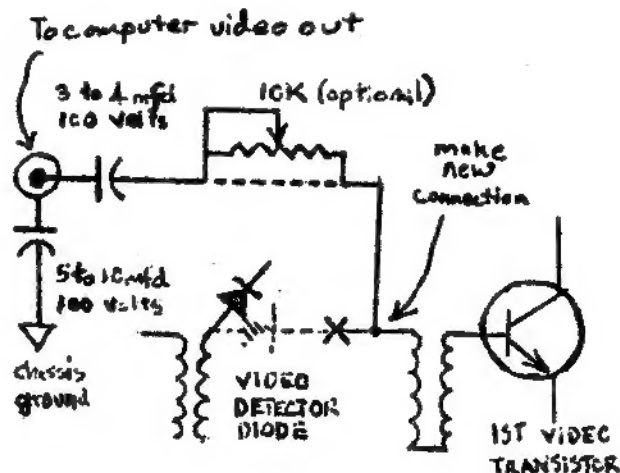
I am currently designing a speech synthesizer using the SPO256 for the TS1000 and TS2068. In future newsletters I will discuss the theory of word generation using the SPO256. Once I complete the circuit I will put it in the newsletter. Then I will discuss a short machine code program that will enable you to use the speech processor in BASIC programs.

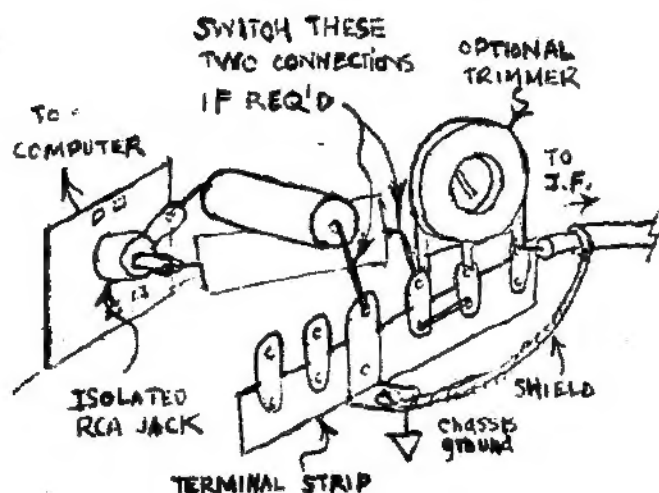
Brian Little

DON'T Convert Your TV into a Computer Monitor

It's not too difficult to convert any B&W or recent color television into a direct-video monitor for your 2068. Being a T.V. technician by trade, I was not satisfied with the hashy-trashy display on my new computer since my old ZX-81 had a UHF RF modulator and put out a very clean picture. I found a 12" B&W transistor junker at the shop that only needed a fresh CRT, put in a tube from another abandoned set and converted it.

The most important fact about almost all T.V.'s today is that the CHASSIS GROUND IS NOT EARTH GROUND. In order to eliminate the necessity of an expensive power transformer, the chassis ground is A.C. ground and can have up to 117 volts A.C. potential to earth ground. This means we have to use capacitors for both ground and to couple video into the set. I found that 10 mfd was more than enough to eliminate any tearing in the video due to the lack of a real ground. Use 3 or 4 mfd. for the signal capacitor. I modified my set into a monitor only, but it is possible to add a switch to cut off one of the I.F. transistors and make a TV/monitor.





Start out by using a schematic or other means and find the video detector diode and the first video transistor. The monitor output of your computer is injected after the video detector and before the first video amp. Mount an RCA jack installed in a plastic card next to a place where you can cut a hole in the cabinet. A cardboard template that fits over one of the controls that projects out of the back makes

locating the hole in the cabinet easy. Mount a terminal strip near the jack and run the two capacitors between it and the jack. Connect one between chassis ground and the outside of the RCA jack. Connect the other capacitor between the center of the jack and the center of the shielded cable. Run the shielded cable into the I.F. and solder the center in the hole left after you have pulled up an end of the video detector diode. After you make certain that both parts of the jack are isolated, it's time to switch your computer's cable from RF to the monitor jack and hook up the set and see clean direct video. Now, if the picture is negative and flipping, the fix is easy. Your set has negative video so just switch the connections of the coupling capacitors. If the signal seems to be too strong or there are double images; adding a 10K ohm trim pot should take care of it. On a color TV you can re-center the tint by using the proper adjusting tool on the burst transformer. If you're adjusting this transformer, then the slightest adjustment makes a huge difference in the tint. If the color is weak, the ACC/Killer trim pot will take care of that. I found that it's also good to disconnect the speaker and replace it with a 10 ohm 1 watt dummy load.

This conversion works for both B&W or color sets. I'm using the 12" set I modified right now to write this article. The display on it is as good as commercial monitors I've seen being driven by 2068s.

- John Monkus

INTERNAL STOP-WATCH

In revising programs or comparing techniques I often use the System Variable **FRAMES** to measure elapsed time.

Near the start of the program temporarily insert:

```
9 POKE 23672,0:POKE 23673,0
```

That will reset the counters to 0. They will advance one unit per 1/60.1145 second.

Near the end of the program insert:

```
999 PRINT PEEK 23672 + 256*PEEK 23673.
```

For direct comparisons just note the number of units for each trial. If it is desired to measure directly in seconds, use:

```
999 PRINT INT((PEEK 23672 + 256*PEEK 23673 + .5)/100/60.1145 + .5)/100
```

This provides averaging, since the counter jumps in 16ms steps while the elapsed time is continuous. Then the result is rounded to two decimal places. It should be accurate to about .01 second.

H.E. Ueppler

PARTS LIST

RCA jack mounted on a plastic card
3 to 4 mfd capacitor @ 100 volts
5 to 10 mfd capacitor @ 100 volts
shielded audio cable
5 or 6 lug terminal strip
(optional) 10K trim pot
(optional) 10 ohm 1 watt resistor

Lifted from S.U.M, 5/85

NAVY TEAR-DOWN INSPECTIONS, AND YOU

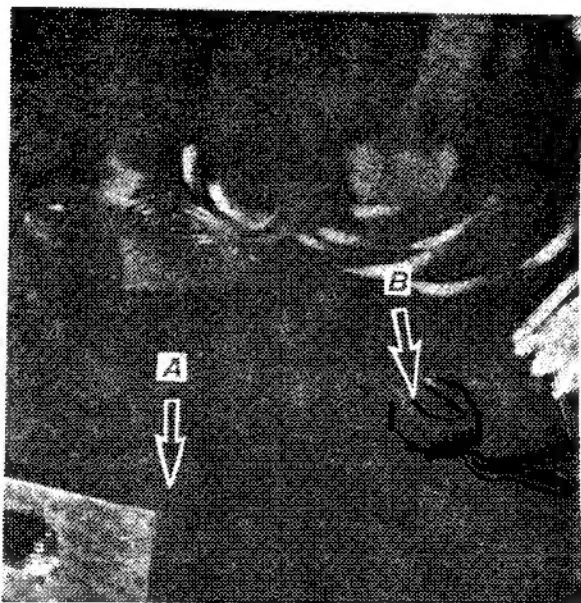
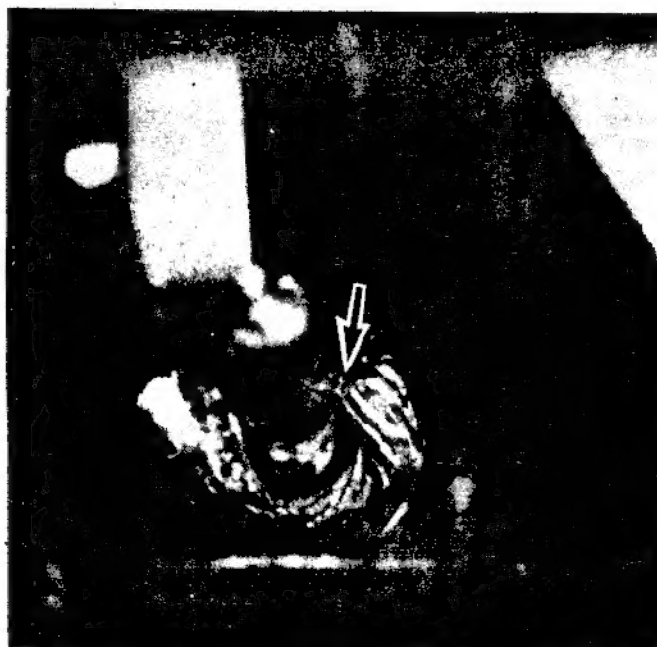
Data and info from Aviation Week & Space Technology, June 3, 1985.

The Navy has conducted tear-down inspections of missiles delivered by Hughes as certified good weapons. While the Phoenix program has not suffered an exceptionally high failure rate, a number of defects were identified. The problem of these hidden defects may be a pervasive one that extends to a variety of military programs.

Aside from the political implications for Hughes, the details of what was found are of interest to us as computer hobbyists and amateur electronic technicians.

A number of defects and faults were found. The good news is that Aviation Week didn't report any mechanical engineering or production defects. The bad news is that there were a wide variety of electrical sins concealed within the Phoenix's sleek skin. However, the faults discovered by the Navy can serve as a textbook of items to attend to as we modify our computers and their peripherals.

This unsoldered wire provided sufficient electrical conductivity to pass factory tests, but in a harsh missile environment it is a likely source of weapon failure.



One of two screws used to secure two halves of an electrical connector (B) is used improperly to provide an electrical ground connection instead of using a separate terminal. If the connector is separated during maintenance, the operator may forget to reconnect the ground wire. Another potential source of failure is the routing of unsupported cable (A) over the edge of metal where it can chafe during vibration.

How the problem has developed

About half of the problems found stem from inadequate attention to good design practices. Some of these stem from a false sense of economy, due partly to tight schedules. For example, during full scale development, engineers often make minor changes in avionics circuits. This may require the addition of a few components and connections that weren't planned when the boards were laid out.

Diode added to the circuit board after it was laid out is cemented to the board (A), where it will be subjected to greater than necessary vibration stress. Additionally, one of its leads (B) has too little clearance from the board and could short out during operational use.



It has been proposed that there should be an upper limit of five jumpers allowed on each board—if that number is exceeded, the board should be redesigned.

The faults themselves

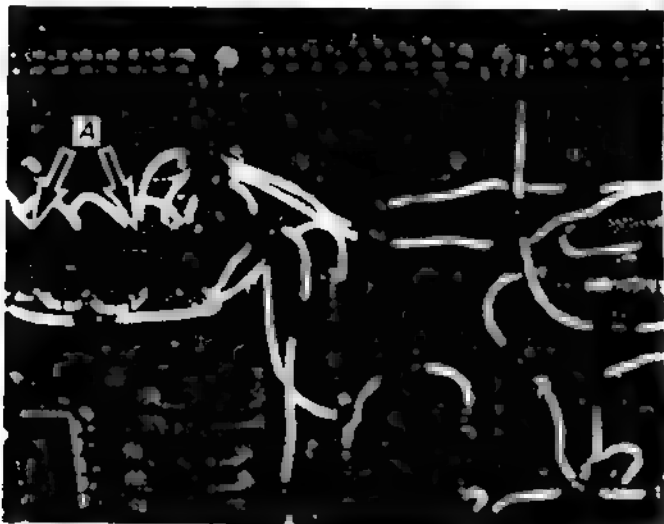
The tear-downs were conducted with Hughes' full



Use of a bare wire that bridges another is a bad practice that can result in a short circuit.

cooperation. "After the shock, Hughes has put in a tremendous effort to resolve the problem" Michael LaVersa, director of quality assurance in the Office of Naval Acquisition Support.

During teardown inspections, LaVersa said, "We found an appalling amount of junk—blobs of loose solder, small pieces of loose wire and metal flakes that can cause short circuits."



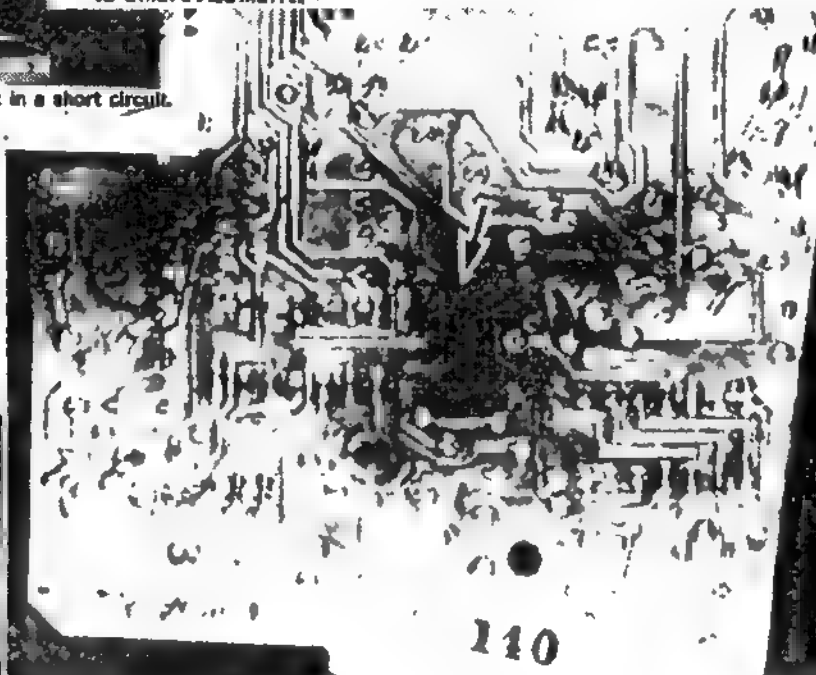
Navy teardown inspections of missiles and other weapon systems have revealed poor workmanship, but a number result from poor design practices, as shown by this printed circuit board. The numerous white wires reflect design changes made since the circuit board originally was laid out. Also, a microcircuit (arrows A) was added and installed in make-shift fashion by cementing its backside to the circuit board with its terminals facing out. This and accompanying photos were taken of hardware that had been delivered or was ready for delivery to the Navy.

He noted that inspection revealed wires that were never soldered to terminals but which passed functional test because they were tinned and partially wrapped around a terminal. Defective solder joints also are encountered frequently.

Other problems are due more to poor engineering design. For example, LaVersa displayed a photo of a circuit board where an insulating sleeve had been charred. The design was faulty because it required the workman to insert the tip of the hot iron carefully into a recessed well, which was extremely difficult to do without touching the sleeve.

A more widespread problem, the "dead bug" is one in which a component has been added after the circuit board has been designed so that there is no prepared socket to hold it. Instead, it is cemented to the board with its leads pointing upward, resembling a dead bug. Sometimes the dead bug problem is compounded when the leads of the chip are used as support terminals to which other components are attached.

Some more subtle sources of potential failure are aluminum foil nameplates that had begun to peel off, and devices with gold-plated leads that have not been tinned before soldering, which could lead to embrittlement.



A more obvious design deficiency was found on one circuit board on which a resistor was being run far beyond its rating. The result was that heat had scorched the circuit board and caused nearby solder joints to reflow.

These photos, and the resultant publicity, are being used to motivate a number of defense contractors to make greater efforts to maintain quality.

MF/Aviation Week

Sinclair: the crucial week



Sinclair: fighting on

by Richard Brooks

SIR Clive Sinclair is facing what could be the most critical week of his controversial career - a week which might well make or finally break the computer entrepreneur.

After one white knight, in the shape of Robert Maxwell, proprietor of The Mirror, suddenly dropped his £1.2m rescue of Sinclair Research on Friday, another, Dixons the retailers, turned up and tomorrow begins a three month sales blitz of Sinclair products.

Last night Sinclair was putting a brave face on the turnaround. He said that the £10m Dixons contract was "immensely exciting" and that "we can now view the future with complete confidence". He dismissed suggestions that his survival depended on a takeover bid. But crucial questions remain:

Will Dixons be the saviour, Sinclair to ardently pant? And why did Maxwell, after sewing up a deal back in June - which was splashed with great pride across the front page of his newspaper, then unsitch it? The undoing of the deal only rated a small story on the Mirror's page two yesterday.



Maxwell: howling onto

"Sinclair is the undisputed brand leader in computers, and as the country's leading retailer of computers we are delighted to have signed this major contract," says Mart Souhami, Dixons' chief executive speaking from his holiday in Venice.

Dixons says that it has bought approximately 160,000 computers and TVs to sell in the lead up to Christmas. "We have been negotiating with Sir Clive for some time, and we were not going to give any publicity to this contract, which is a contract in the normal course of business," added Souhami.

Sinclair's Spectrum, its main product introduced in April 1982, has this year had sales of about 130,000. The QL, on sale for the past 15 months, has probably only sold 60,000 in that period. Sales for both products are considerably down on what had been expected. Even so, Sinclair does still have about 40% of the home computer market for machines under £500.

Sinclair Research's results are expected next month. They are likely to show a sizeable loss on sales of about £100m. The firm now hopes that sales in the current financial year

will reach £75m, and will produce a return to profit.

"The Maxwell deal was one needed for an emergency," says Sinclair. "Now that emergency is passed with the Dixons deal which takes the bulk of our unsold stock. We do not need another firm to take us over. What I am looking for however is a group of investors to put up some more money."

Maxwell first announced a deal with Sinclair in June after a deal, admittedly conditional, was put together at a party at Headington Hall, Maxwell's council-owned Oxford home.

But within just a few days of the conditional deal it was becoming clear that Sinclair's accounts needed much more careful analysis. The accountants, Coopers & Lybrand, were sent in and their report, which was received by Maxwell's merchant bank, Hill Samuel, in July did not make pleasant reading. It confirmed unsold stocks of £35m, and operating losses. More important, it concluded that the prospects for Sinclair Research were poor. It would be a gamble for Maxwell therefore to continue with the takeover.



Souhami buying in

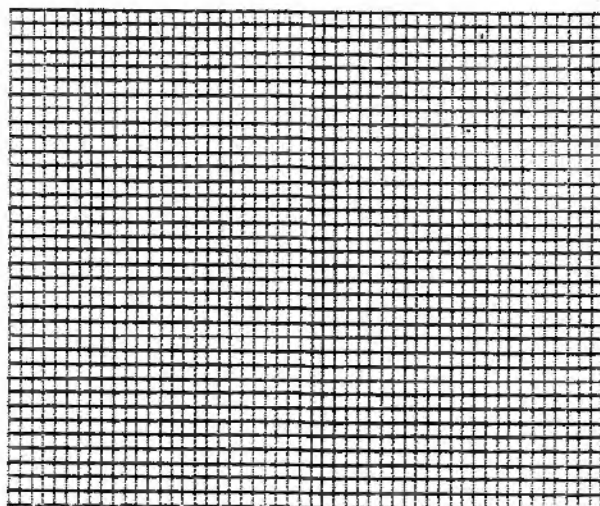
It is now clear that when Maxwell had first made the deal for once his heart had ruled his head. Maxwell, a very shrewd businessman, liked Sinclair, and thought that one great Englishman could bail out another Englishman in his hour of need.

In reality Maxwell too is nearing his own hour of need. He needs cash for other plans, and this was just another reason for pulling out. Last week he raised £80m through National Westminster Bank in loans. He needs the money to finance £60m worth of new colour printing presses for the Mirror Group, which itself is not doing well, with an expected profit this year of only about £2m on a turnover of more than £200m.

Sunday Times
of London

August 11, 1985

Graph Paper



```
10 FOR X=0 TO 255 STEP 5
20 PLOT X,0
30 DRAW 0,175
40 NEXT X
50 FOR Y=0 TO 175 STEP 5
60 PLOT 0,Y
70 DRAW 255,0
80 NEXT Y
```

On simple graphing jobs like this, the DRAW function works much faster than PLOTting it. This one takes 5 seconds, as compared with 3 minutes for a PLOT program. Carolyn Barasch

ERROR: 23681 IS USED

The 2068 User Manual is in error on page 264 where it shows that memory location 23681 is "Not used".

Location 23681 is the MSB companion to 23680 and relates to the printer buffer. If 23681 is poked with anything other than 91 while the printer is in use the next line on the printer will be blank.

A safer place for temporary storage of a single byte is 23747.

H.E. Ueppler

Speech Synthesis

L.J.S.T. reports that the September '85 Computer Digest section of Radio Electronics magazine has an article by Jason Kinser on low tech "Voice Reproduction" for the 1000. You can reproduce your voice using his short m/c routine and some very simple, already assembled hardware from Radio Shack.

Cryptogram

George White, a the author of the club library program CRYPTOPAD, has given us five months of seasonal cryptograms. Enjoy!

CRYPTOGRAM:

KAYO CLASSX PSNITC CNZ WAYZ KNOW

LSFJRWYI XHWYINLZ, TS WAYZ FYNO

CWIRLWRIYT NCCYFPXZ XNODRNDY SI

NO HOTHMMYIYOW DNFY SM "JSOD"?

SCROLLING

Do you get tired of the incredibly slow and jerky SCROLL command on the T31000? Take heart true programmers. The following machine code program will not only permit you to SCROLL up. It will also permit SCROLL down, SCROLL left, and SCROLL right.

After you type in the program SAVE it. Then RUN the program. The program is then stored safely above RAMTOP so that you can use it with any program. To use the SCROLLS use this line in your program:

```
LET Z=USR X
where X=32521 for SCROLL up
        32542 for SCROLL down
        32563 for SCROLL right
        32584 for SCROLL left
```

6

```
1 REM 12345678901234567890123
45678901234567890123456789012345
67890123456789012345678901234567
89012345678901
```

```
2 LET A$="21097F220440EB01550
0219240E0B0C9E0550C4013212100190
1F502EDB006202B7110FCC92A0C4011F
602424B19EB21210019EBEDB80520237
210FCC90176172A0C401600237EB9280
4725718F710F3C90176192A104015002
B7EB92804725718F710F3C9"
```

```
3 FAST
4 LET A=16514
5 FOR B=1 TO LEN A$-1 STEP 2
6 POKE A,16*CODE A$(B)+CODE A
$(B+1)-476
7 LET A=A+1
8 NEXT B
9 RAND USR 16514
10 NEW
```

BRIAN LITTLE

CRYPTOGRAM Solution:

RETURN BOARD YAY YAY 203A08 JOHNS NEHW
YJBM22A2D NAEM STRUCTURED YD YD YD YD
"ONON" OF GAME OF "ONON"



There is a cassette tape available featuring ten top hit game programs from England, for the Spectrum computer. All proceeds from the sale of the software go to the BAND-AID TRUST FUND to aid starving Ethiopians. The Band-Aid project was first implemented when British Pop Music Stars recorded and donated a Christmas song for the effort. The "greatest hits" tape is called SOFTAID, and contains the following games: Spellbound (Beyond), Starbike (The Edge), Kokotoni Wilf (Elite), The Pyramid (Fantasy), Horace Goes Ski-ing (Melbourne House/Prion), Gilligan's Gold (Ocean), Ant Attack (Quicksilver), 3D Tank Duel (Real-Time), Sorcery (Virgin), and Jack and the Beanstalk (Thor). On the "flip" side of the tape is the recorded version of the song "Do They Know It's Christmas?"

Rod Cousins of Quicksilver organised the software relief project, and hopes that it will raise some £200,000 for the Ethiopians. Here in the U.S. the SOFTAID Spectrum tape is available from Susan Ziegler, Software Services, 14307 BenBrush, San Antonio, TX 78248, for a mere \$6.25 plus \$2.00 for first class p & h. Bob Dyl of the English Micro Connection, 15 Kilburn Ct., Newport, RI 02840 will also have substantial supplies of SOFTAID shortly. The British software producers have been very generous in their efforts. The tape is very reasonably priced, and everyone should obtain their own copy...pirated versions won't help dying people one bit. Note: There is also a version for the Commodore 64.

Lifted from L.I.S.T, 7/85

continued from p.2

Information Received

A 2 page letter from the T.S. Connection, 3832 Watterson Ave., Cincinnati, OH 45227; confirming what was printed here last month. They state: "the T/S Connection is NOT and has NEVER been an authorized service facility of the Timex Corporation." Further, "that Timex Products Service Department in Little Rock continues to do In and Out of Warranty service."

They blame the strange, simultaneous announcement of their status as sole authorized Timex service distributor on "overzealous editors of newsletters, in their desire to feed information to their hungry readers...." If you detect a bit of defensiveness in this editor, you may be right (and I never printed the story).

Last Meeting:

If this issue seems to be thinner than before, last month's general meeting was not. We had a full bill, with John Conger demonstrating binary arithmetic, and Tom Bent programming an EPROM live. In addition, we had a surprise guest from the Cincinnati TSUG, Mark Szabo - a bright and pleasant 17-year-old, who demonstrated his excellent graphics program in the back, and gave us an extempore talk about the Cincinnati User's Group. All the while, Jim MacKenzie ran the tape library concession in the back room.

Newsletter Digest

From September LIST, P.O. Box 438, Centerport NY 11721-0438, a full issue, complete with a seven page article on cassette data storage (the author, Cedrick Bastiaans, apologises that he wasn't able to reproduce his scanning electron micrograph images of tape surface in the Xerox). He does provide oscilloscope traces that graphically demonstrate catastrophic dropouts due to poor tape, dust, scratches, fingerprints, creases, and more.

From the May-August Sincus News, P.O. Box 523, Owego, NY 13827, comes an apology for missing an issue, a nice pocket review of current Timex publications, a listing of NY timex BBS numbers, and last, but not least, a construction article by Wes Brzozowski on a T/S 1000 Keyboard that plugs on the back-bus, capped by a further installment of his series on T/S 2068 interrupt handling.

From the May-June TAS-BAM U.G., P.O. Box 644, Safety Harbor, FL 33572, comes news that the FCC has approved the QL (credited to Syncware-News), and reviews of the Rotronics Wafadrive and a word processor that accompanies it. In addition to a number of other supplier's addresses and publications.

From the August Hampton Roads T/S U.G., 17 Rex Ave., Portsmouth, VA 23702-2925, a recap of Sinclair's recent ups and downs condensed from CATS articles (see the latest chapter in this saga in this issue), and a nine page listing of Timex vendors.

From July SincLink (alias Timelinez), 6675 Clifford Drive, Cupertino, CA 95014-4530, comes a collection of photo-reduced newsletters and letters that is even tinier than LIST's usual collection - but there's a lot of information hiding in there.

From Summer QTS, 4 Butterfly Dr., Hauppauge, NY 11788, comes a READ/DATA routine for the 1000 (not as good as mine [March, 1985]), and a number of BASIC tutorial articles.

WANTED: Assistant Editor. Learn the joys of paste-up; be responsible for perhaps four camera-ready pages per month, assembled from submitted articles. Fun! Glory! POWER! Mislead the public! commit libel from invulnerable position! (remember Absence of Malice?)

Congratulations,
C.A.T.S.
Success in the coming year!

A fellow computerer

Several times we have brought to your attention products, & services which merit your investigation. Here are a couple of the publications we have recently read, and invite you to do the same:

TIME DESIGNS-6 issues a year for \$15

Over 30 pages in last issue, full of interesting articles- more for the novice/intermediate user but any avid user would enjoy. TIME DESIGNS, 29722 Hult Rd. Colton, CA 97017

TSS Newsnotes- 12 times a year for \$10

Over 14 pages-like a newsletter, news, ideas and tips, includes Q&A. If you don't have a US down the block, then this is good. T.S. Services, PO Box 15214, Red Bank, TN 37415-0214

T-8 Horizons- 12 times a year- \$15 a year

About 30 pages-I'm looking at last August's issue-again more for the average die hard 2068 user, and they been around since 1984. T-8 Horizons, 2002 Summit St. Portsmouth, OH 43662

SyncWare News - 6 issues a year-\$16.95

More for the advanced user, well written and full of interesting ideas and articles on how and why the 2068 works. Has 1000 info! SyncWare News, PO Box 64, Jefferson, NH 03583

Quarters- 4 times a year. \$8

Advertised as being on the use of BASIC. Have not yet seen one. MMJ DATA SYSTEMS, 4 Butterfly Dr. Hauppauge, NY 11788

S.U.M.-Sinclair/Time User's Magazine-12 issues for \$12

About 14 pages an issue. Usually has a couple in depth articles on hardware do it yourselves would enjoy. Very GOOD VALUE! SUM Magazine, 3224 NW 30 Avenue, Gainesville, FL 32605

SYNTAX. ? a year. for \$48

One of the oldest publications since early 1981 in the USE of Sinclair machines-was THE magazine. Not seen much lately. SYNTAX, The Harvard Group, RD 2, Box 457, Harvard, MA 01451

58-8-85
Sincus

Capitol Area Times/Sinclair Users' Group
P.O. Box 725
Bladensburg, MD 20710

| | | | |
|--|-----------|-----------------|-------|
| Name | _____ | | |
| Address | _____ | | |
| Phone | Home | Office | ZIP |
| Memberships - \$15.00 (family/individual)/make checks payable to C.A.T.S. | | | |
| If family membership, please list family members participating: | | | |
| Occupation | _____ | | |
| Ham Radio call sign | _____ | | |
| | Equipment | | |
| ZX 80 | | Roll size | _____ |
| HA 80 | | Full keyboard | _____ |
| ZX 81 | | Printer | _____ |
| TS 1000 | | type | _____ |
| TS 2000 | | other interface | _____ |
| Special interest use for computers i.e., games, ham radio interface, business, other, etc. _____ | | | |
| Languages: Basic | _____ | Other | _____ |
| | Machine | _____ | |
| No. of years computer experience | _____ | | |
| What committees would you like to serve on? | _____ | | |
| Comments: Where did you hear of C.A.T.S.? | _____ | | |
| Do not write below: | | | |
| Ch. Pd. | Amt. | Membership No. | |
| Ca. | Ch. | _____ | |

The mailing address of the Capitol Area Timex/Sinclair User's Group is:

Capitol Area Timex/Sinclair User's group
P.O. Box 725
Bladensburg, MD 20710

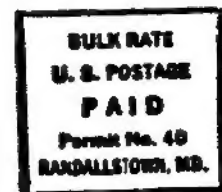
CATS is a non-profit special interest organization dedicated to serving the interests of those who own, use, or are interested in learning more about the Timex/Sinclair family of personal computers.

The official contact person for CATS is JULES GESSANG:
301-922-0767

Meetings are held on the second Saturday of each month at 2 P.M. in the large meeting room of the New Carrollton Branch Public Library.

Ham Radio Network Information
OZX Net... Wednesdays, 9p.m. local time; 14.345 MHz NV4F NCS
Eastern Regional Sinclair Net... Sundays, 1600 Z; 7.245 MHz K0ZF NCS

CATS Newsletter
P.O. Box 725
Bladensburg MD 20710



Next Meeting, Saturday, September 14, 2:00 PM
Don't forget the hardware meeting, 10:00 AM, same day.

New Carrollton Public Library
7414 Riverdale Road, New Carrollton, MD

IF YOU ARE NOT A MEMBER OF CATS, THIS IS THE ONLY ISSUE YOU WILL RECIEVE
Dues = \$15.00 per year, per family.

DATED MATERIAL